

- (54) Window condensation disposal**

typically including a drain tube (19) through an aperture (18) formed in the pane itself. The conducting means may include a capillary wick for drawing the condensate from the trough and leading it directly to the aperture or to an intermediate collecting reservoir or sump.



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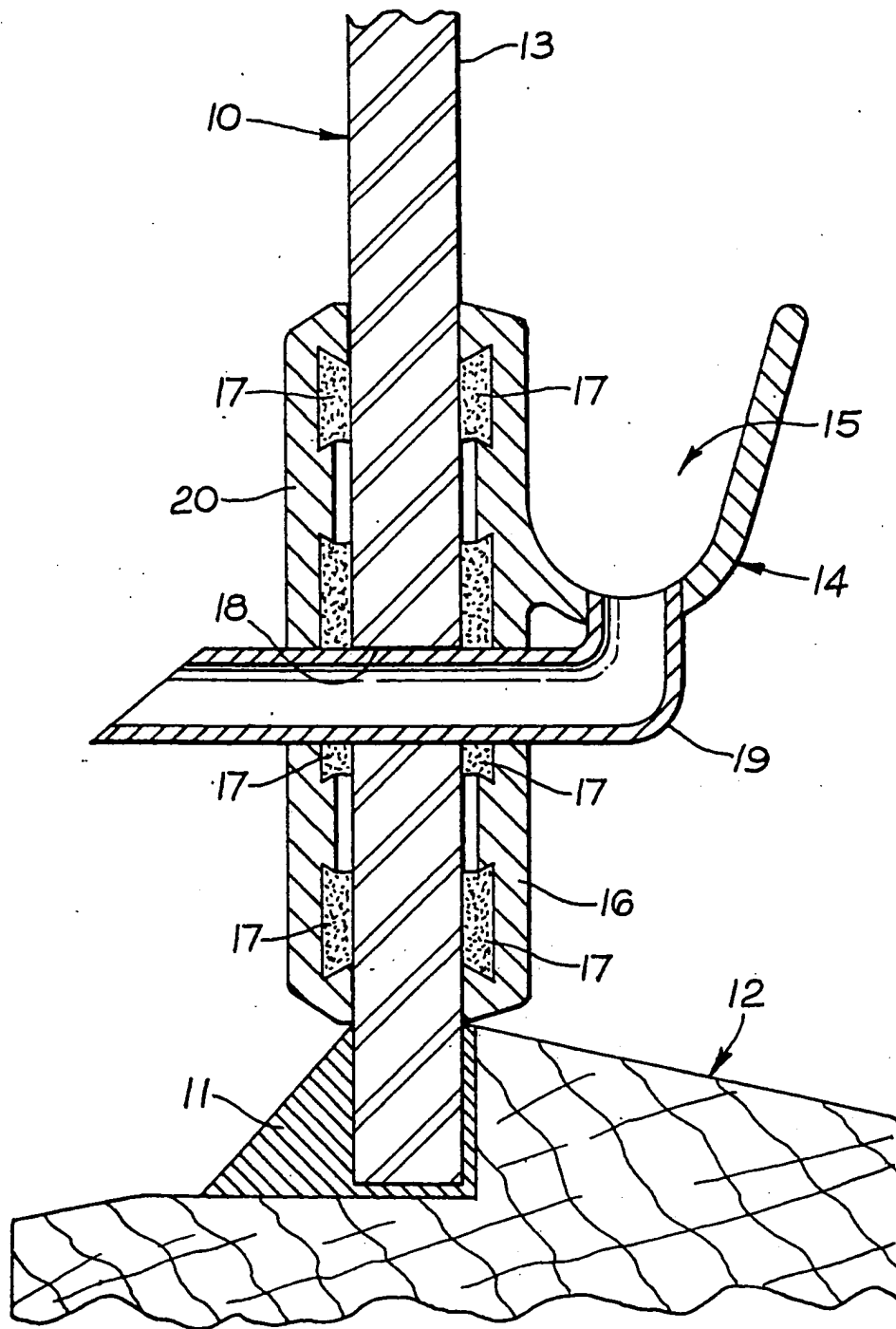


Fig. 1

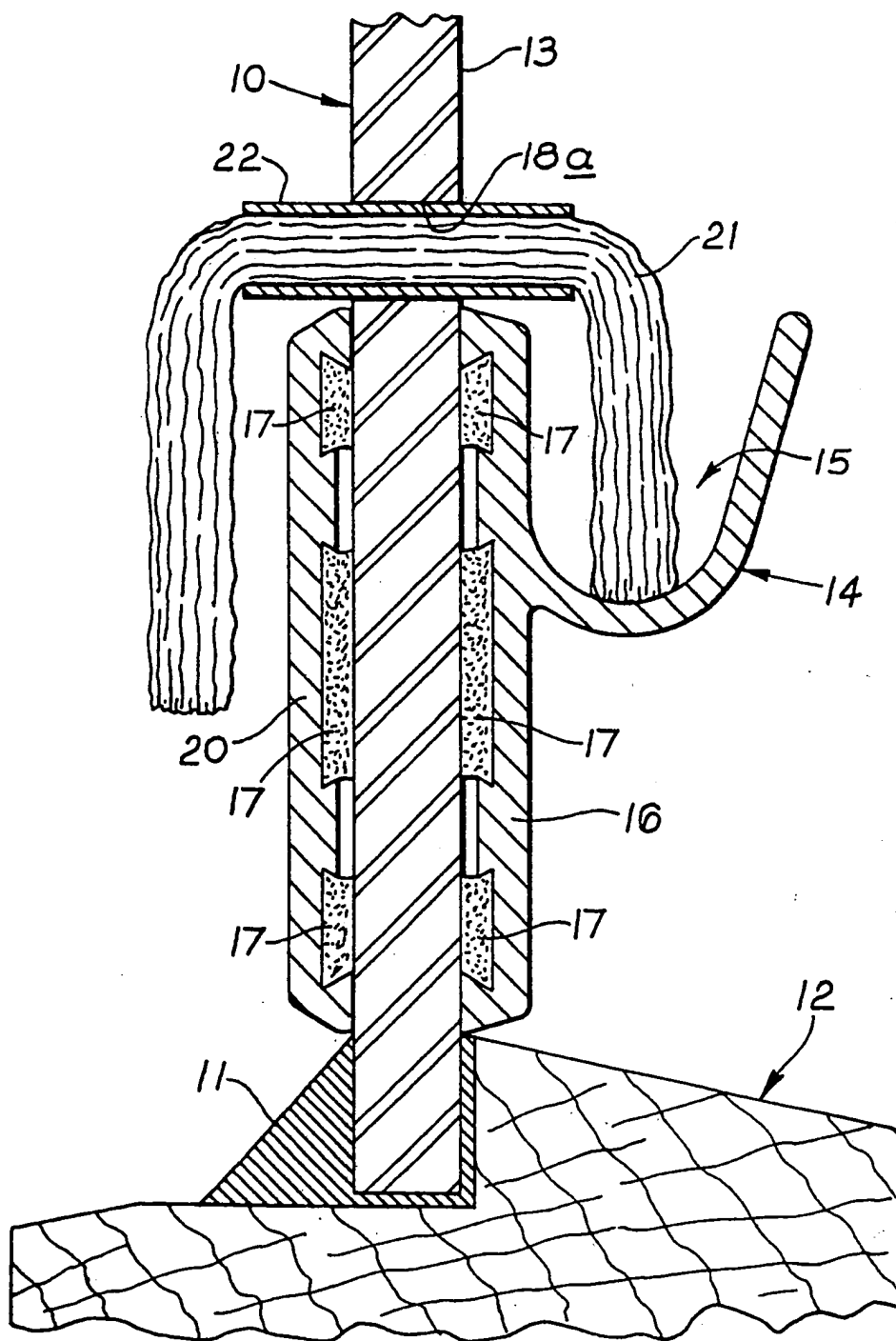


Fig. 2

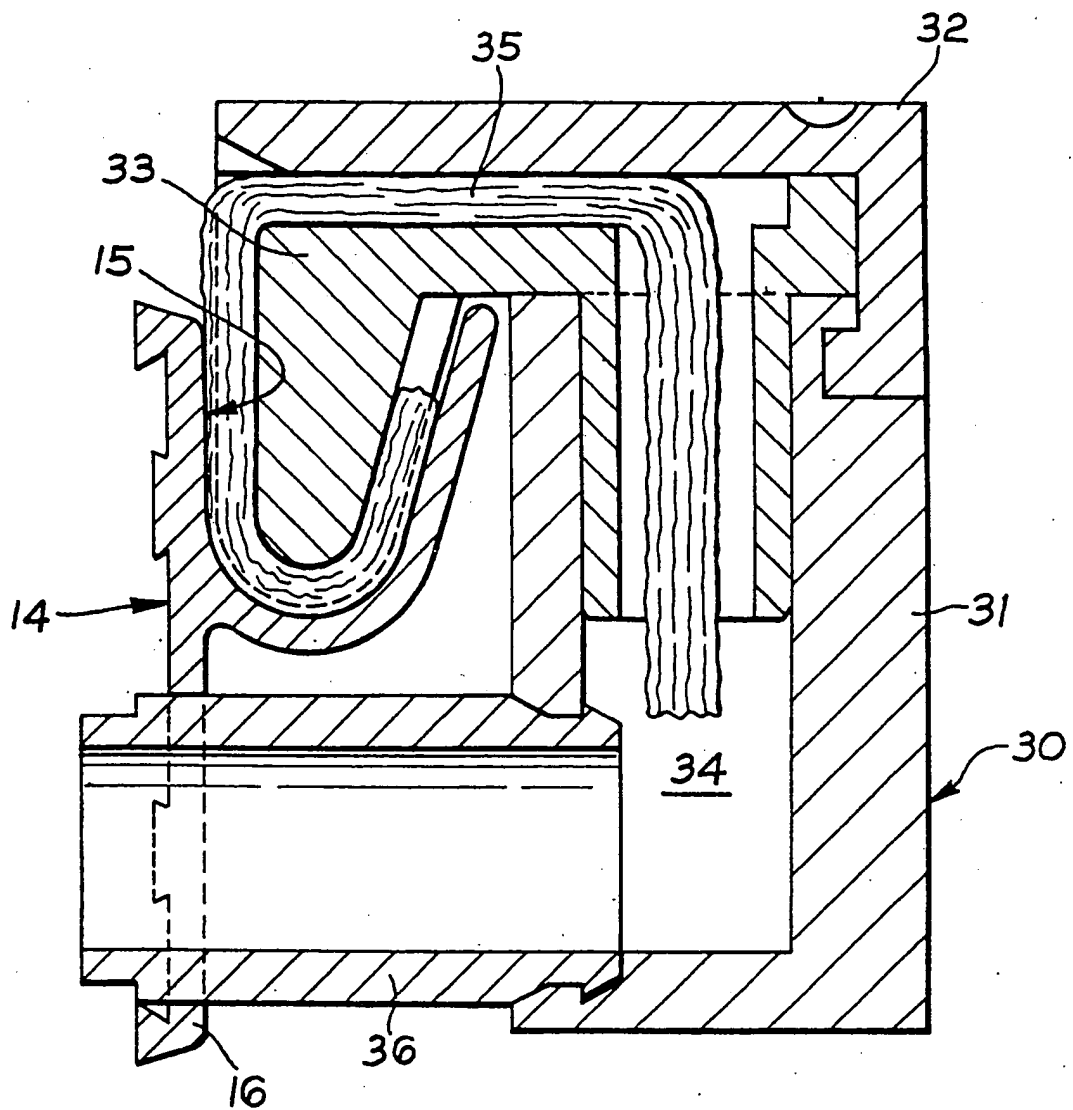
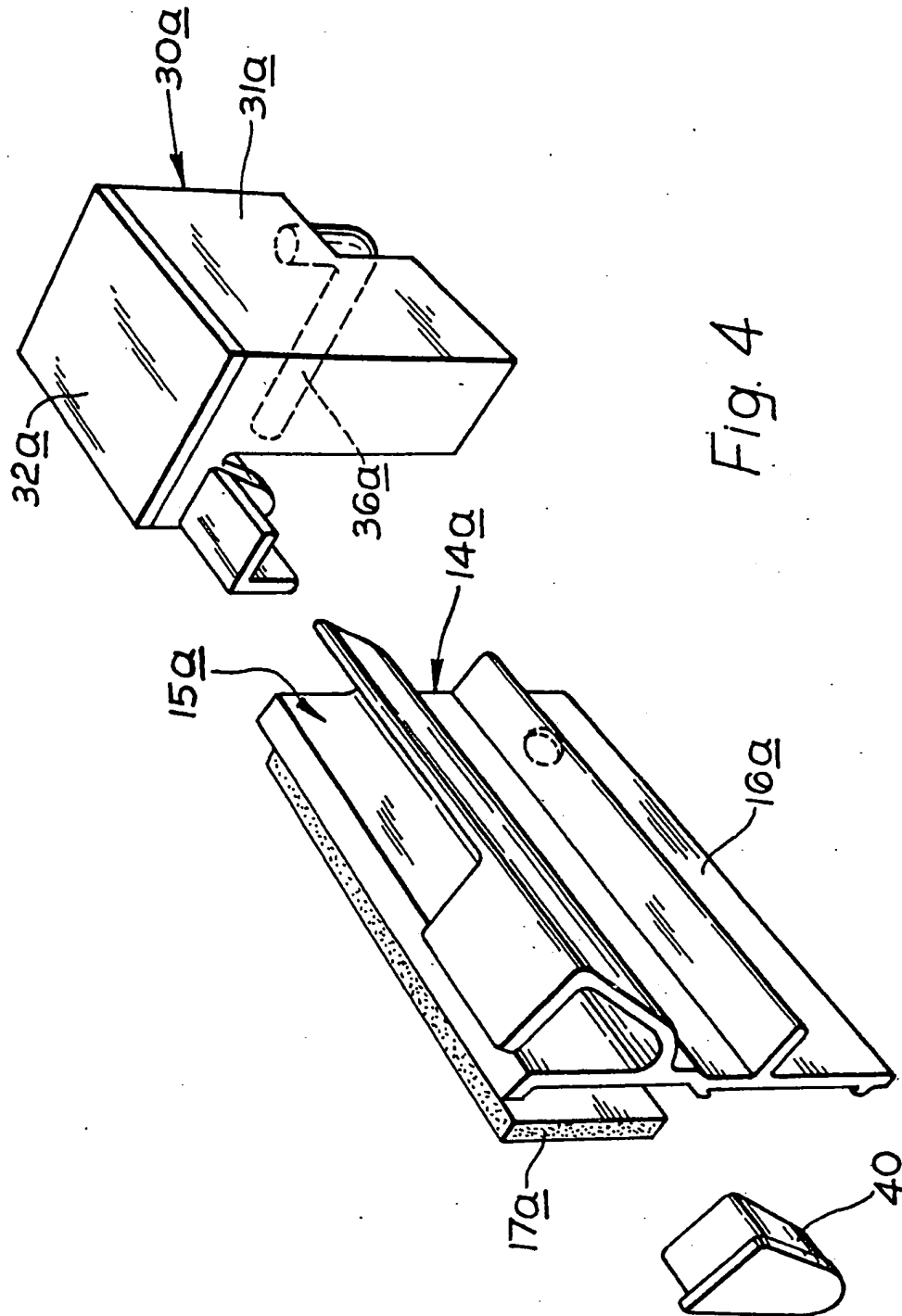
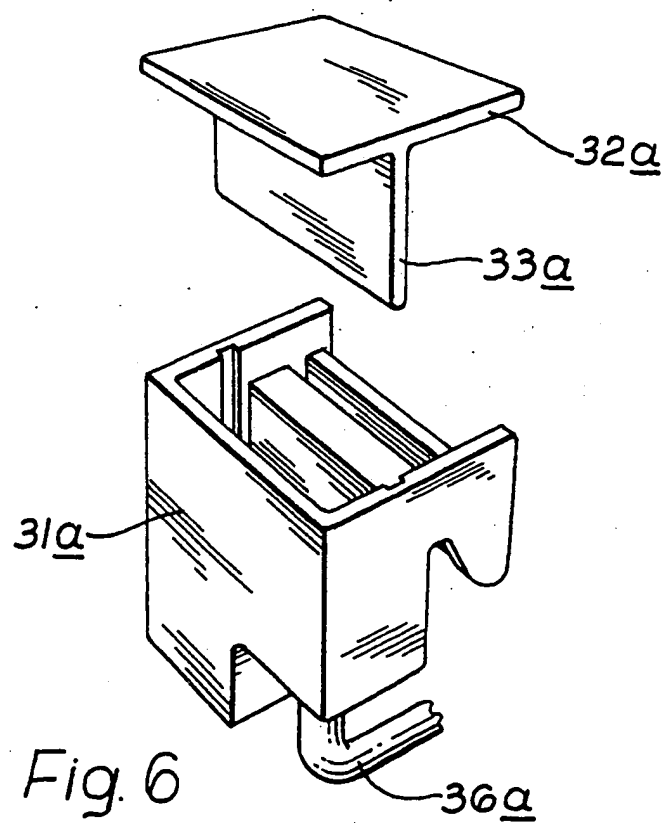
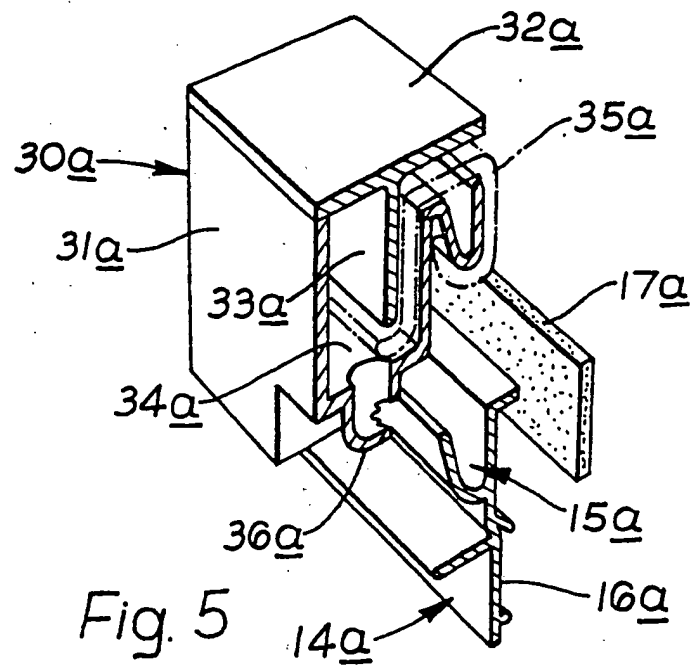


Fig. 3



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## SPECIFICATION

## Wind w cond nsation disp sal

This invention relates to the disposal of condensation accumulating on and flowing down the interior surface of window panes.

If left unattended to this condensation can cause considerable damage to window frames, paintwork and decorations, staining of curtains, wallpaper and the like, and may even contribute to the growth of mould or fungus on interior plasterwork and wall surfaces and/or unsightly staining thereof.

Various proposals have been made for the collecting or disposal of such condensation but known arrangements for doing this often involve fairly complex modifications to the window structure or even have to be incorporated in a purpose built window frame or the like at the time of manufacture and/or require regular attention and servicing to remain effective. If condensate is collected in a reservoir or trough it is necessary to remember to empty this periodically or it will overflow so defeating the aim of providing collection means.

The object of the present invention is to provide a method of and apparatus for collection and automatic disposal of window condensation which can be readily applied to existing windows, requires a minimum of skilled work to install, needs little or no maintenance, supervision or servicing once installed, and which can be provided in a form which is adaptable to almost any size and type of window.

According to the invention a method of automatically collecting and disposing of condensation from an interior face of a window pane includes the steps of mounting a collecting trough along the width of a lowermost area of said face to receive condensate flowing down said face in use, forming an aperture through the pane in proximity to said trough, and providing means for automatically conducting accumulated condensate from the trough interior through said aperture so that it is discharged outside the window.

Conveniently said conducting means may incorporate a wick or other capillary element to draw the condensate from the trough interior and conduct it either directly to or through said aperture or into a sump or reservoir formation from which it drains through the aperture by gravity.

It is also contemplated that a duct connected to the trough interior may lead directly to or through the aperture so that the trough itself is drained by gravity.

Preferably the trough is attached to or forms part of a facing panel which is attached by a fluid tight bond to said lowermost area of the pane.

The invention also resides in a device for use in carrying out the above method comprising the trough and conducting means.

Conveniently the trough is provided as a continuous extrusion or moulding, for example of

plastics material, which can be cut to a length to suit the particular size of window pane and then be fitted with stop ends to contain the condensate.

Some practical embodiments of the invention are now described in greater detail with reference to the accompanying drawings in which:

Figure 1 is a diagrammatic cross-section of a first form of installation utilising the invention;

Figure 2 is a like diagram of a second form of installation;

Figure 3 is a cross-sectional view of an assembled device for a third form of installation;

Figure 4 is an exploded perspective view of a modified version of the latter device;

Figure 5 is a perspective sectional view of part of the device shown in Figure 4; and

Figure 6 is a detailed perspective view of a collecting reservoir and lid of the device shown in Figures 4 and 5.

Referring to Figure 1 part of a glazed window of conventional construction is shown comprising a glass pane 10 bedded in putty 11 in a rebate defined by a timber frame of which only part of the bottom glazing bar 12 is shown.

Condensation is liable to accumulate on the inner face 13 of pane 10 and run downwards. In the absence of the installed device now to be described this condensate would reach glazing bar 12 to accumulate on the window sill (not shown) or continue down the interior wall below the window. If the putty joint between the inner face 13 and the rebate of bar 12 should be defective the condensate will enter therebetween causing deterioration of the joint and possible eventual rotting of the window frame or corrosion in the case of a metal frame.

In this example of the application of the invention an extruded plastics trough element 14 is provided whose upper portion is channel shaped to form a horizontal trough 15 and having a generally planar facing panel portion 16 forming one side wall of the trough and extending substantially below it. The face of portion 16 directed away from the trough is grooved longitudinally to receive one or more strips or tapes of adhesive or bonding material 17 which are used to adhere panel portion 16 closely and in fluid tight engagement with a lowermost area of inner face 13 with the lower edge of trough element 14 in abutment with glazing bar 12. before installation the trough element 14 will be cut to length so that it will extend across the full width of pane 10 and stop ends (not shown) will be fitted to close the trough ends.

Before final installation an aperture 18 is drilled through pane 10 at a level immediately below the bottom of trough 15 using a glass boring drill bit. This drilling can be carried out in an existing window working from the interior using reasonable skill and care i.e. by drilling slowly and steadily, lubricating the bit with paraffin or similar oil, not allowing the bit to overheat, and taking care over the final breakthrough. If access to the

outside of the pane is easy it may be preferable to drill halfway from each side.

A drain tube 19 is passed through aperture 18 when drilled to connect with the bottom of trough 15, a hole also being drilled in the lower part of panel portion 16 for this purpose. A fluid tight seal between trough 15 and tube 19 may be formed by the use of an adhesive.

Optionally an outer facing panel 20, also a plastics extrusion of similar profile to panel portion 16 may be mounted on the exterior face of pane 10 again by means of bonding material 17 to provide a uniform appearance, a hole being drilled therein to accommodate tube 19.

This is the simplest form of installation and the trough 15 is directly self-draining by gravity through tube 19.

In the alternative form of installation illustrated in Figure 2 the same form of trough element 14 can be utilised and will be mounted to the pane 10 as described above, optionally with the exterior panel 20 as before.

In this case the aperture 18a is drilled through pane 10 immediately above trough 15. A capillary element in the form of a wick 21, preferably positioned in a guide tube 22 extends through the aperture, an inner portion dipping into the trough 15 so that moisture is drawn upwards therefrom and discharged outside the window.

Though little is required in the way of servicing or maintenance the tube and wick are readily accessible and may be removed from the pane aperture without disturbing the trough element 14 if it is necessary to clean or replace them e.g. should they become clogged.

An arrangement which is preferred as giving a much neater appearance with less liability to possible disturbance or interference e.g. by children is shown in Figure 3. The trough element 14 is as previously described and its mounting on the window has not been shown. A separate box-like collecting reservoir assembly 30 hooks onto the trough 15 and comprises a body portion 31 extending below the level of trough 15, a removable lid 32 which extends over the associated portion of the trough, and a wick retainer 33 which fits below lid 32 and defines a channel leading from the bottom of trough 15 upwardly and above its rim to enter the chamber or sump 34 defined within body 31. Retainer 33 holds a wick 35 in position so that condensate collected in trough 15 is conducted upwards by capillary action and discharged into chamber 34. A drainage tube 36 extends generally horizontally from the bottom of chamber 34 and below trough 15 through an aperture drilled in the lower part of panel portion 16 and through an aperture drilled in the window pane as described above in alignment therewith so that the condensate is automatically discharged outside the window.

Lid 32 is a press or snap fit onto the assembly and can be removed when necessary for access to the wick. This arrangement gives a particularly neat appearance, is compact and readily assembled, and effectively closes off the aperture

through the pane. Assembly 30 will normally be positioned at one end of the trough and in many cases will be hidden by the window curtains.

A variation of the assembly shown in Figure 3 illustrated in Figures 4—6, the components are somewhat differently shaped but the manner of assembly and operation is the same and the same reference numbers suffixed by "a" have been employed for equivalent parts as with reference to Figure 3.

Figure 4 also illustrates the fitting of end stops 40 to trough 15. Figure 5 shows the positioning of the wick 35a and Figure 6 shows how the removable lid 32a fits onto body portion 31a in this version in which a wick retainer 33a is integral with the lid.

The method and devices for condensation disposal in accordance with the invention are automatically self-operating without any action being required by the tenant or other occupier of the property involved, which is a particular advantage in the case of public authority housing, institutions such as old peoples homes, schools or other public buildings and the like and/or in cases where windows may be difficult of access e.g. due to height. The device is relatively cheap and easy and quick to install so that it is a practical proposition even where windows have a number of panes, and will give rise to substantial benefits in improved condition of the property and long term reduction of maintenance and repair to window frames, paintwork, decorating etc. Repair, maintenance or replacement, though infrequently required, is easily carried out without particular skill and as nothing has to be done to the window frame itself the invention can readily be applied to existing windows, even those having metal or composite frames.

#### Claims (filed on 15th Sept '82)

1. A method of automatically collecting and disposing of condensation from an interior face of a window pane including the steps of mounting a collecting trough along the width of a lowermost area of said face to receive condensate flowing down said face in use, forming an aperture through the pane in proximity to said trough, and providing means for automatically conducting accumulated condensate from the trough interior through said aperture so that it is discharged outside the window.

2. A method as in Claim 1 wherein said conducting means is a duct connected to the trough interior and leading directly to or through the aperture at a level below the trough so that the latter is drained by gravity.

3. A method as in Claim 1 wherein the conducting means includes a wick or other capillary element arranged to draw the condensate from the trough interior for discharge through the aperture.

4. A method as in Claim 3 wherein the capillary element conducts the condensate directly to or through said aperture.

5. A method as in Claim 3 wherein the



conducting means includes a sump or reservoir formation into which condensate is operatively conducted by the capillary element and from which the condensate is drained through the aperture by gravity.

5 6. A method as in Claim 5 wherein the aperture is formed below the trough.

7. A method as in Claim 5 or 6 wherein the sump or reservoir formation has a removable lid and is provided with a wick retainer holding the capillary element in its operative relationship to the trough.

8. A method as in Claim 7 wherein the wick retainer is formed integrally with the lid.

15 9. A method as in any preceding claim including the provision of a facing panel bonded to said lowermost area of said interior face and carrying the collecting trough.

10. A method as in Claim 9 wherein said facing panel is bonded by means of one or more strips or tapes of an adhesive or bonding material providing fluid-tight engagement with said area.

11. A method as in any preceding claim including the step of providing an outer facing panel mounted on the exterior face of the pane to overlie the area on which the trough is mounted.

12. A method as in any preceding claim including the step of providing a drain tube extending through said aperture for conducting the condensate away from the pane.

13. A method as in any preceding claim wherein the collecting trough is formed as a continuous extrusion of plastics material and further including the steps of cutting said extrusion to a length to correspond with the width of the pane and fitting end stops thereto to

complete the trough assembly.

14. A device when used in the method of any preceding claim comprising a collecting trough and associated conducting means adapted to automatically conduct accumulated condensate from the trough interior through an aperture formed in a window pane.

15. A window assembly including a window pane, a collecting trough mounted along the width of a lowermost area of an interior face of said pane to receive condensate flowing down said face in use, and means for automatically conducting accumulated condensate from the trough interior through an aperture formed in said pane in proximity to the trough so that the condensate is discharged outside the window.

16. A method of automatically collecting and disposing of condensation from an interior face of a window pane substantially as hereinbefore described with reference to Figure 1; Figure 2; Figure 3; or Figures 4—6 of the accompanying drawings.

17. A device for automatically collecting and disposing of condensation from an interior face of a window pane by drainage through an aperture in said pane substantially as hereinbefore described with reference to and as shown in Figure 1; Figure 2; Figure 3; or Figures 4—6 of the accompanying drawings.

18. A window assembly including an arrangement for collecting and disposing of condensate substantially as hereinbefore described with reference to and as shown in Figure 1; Figure 2; Figure 3; or Figures 4—6 of the accompanying drawings.